

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-4. (Cancelled)

5. (New) A hole-assisted single mode optical fiber comprising:

a first cladding region having a uniform refractive index;

a core region with a radius r_1 having a refractive index higher than that of said first cladding region, and placed at a center of said first cladding region; and

a second cladding region including at least four air hole regions, each of which has a radius r_2 , is separated by a distance d from a center of said core region, and is placed in said first cladding region, wherein

the distance d is 2.0 to 4.5 times the radius r_1 of said core region, and the radius r_2 of said air hole regions is equal to or greater than 0.2 times the radius r_1 of said core region, and wherein

said hole-assisted single mode optical fiber has zero-dispersion wavelength characteristics conforming to the ITU-T recommendation G.652 in a range from 1300 nm to 1324 nm, and has a bending loss characteristics equal to or less than 1 dB/m at a bending radius 10 mm, and variations in a mode field diameter by providing said air hole regions is equal to or less than $\pm 10\%$.

6. (New) The hole-assisted single mode optical fiber as claimed in claim 1, wherein the radius r_1 of said core region is from ~~3.2~~ 3.7 μm to $4.8 \mu\text{m}$, and a relative index difference Δ of said core region from said first cladding region is in a range from 0.3% to 0.55%.

7. (New) A hole-assisted single mode optical fiber comprising:

a first cladding region having a uniform refractive index;

a core region with a radius r_1 having a refractive index higher than that of said first cladding region, and placed at a center of said first cladding region; and

a second cladding region including at least four air hole regions, each of which has a radius r_2 , is separated by a distance d from a center of said core region, and is placed in said first cladding region, wherein

a relative index difference Δ of said core region from a refractive index of said first cladding region is in a range from 0.05% to 0.12%, an effective core radius A from the center of said core region to an extreme circumference of said air hole regions is in a range from $23 \mu\text{m}$ to $28 \mu\text{m}$, and wherein

said hole-assisted single mode optical fiber has a theoretical cutoff wavelength characteristics equal to or less than 1100 nm , a bending loss equal to or less than 1 dB/m at a bending radius 10 mm , and effective core radius characteristics equal to or greater than $150 \mu\text{m}^2$ in a wavelength range from 1260 nm to 1625 nm .